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10/717,444	11/21/2003	Simon Alan Spacey		8881

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EXAMINER
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NOBAHAR, ABDULHAKIM

ART UNIT	PAPER NUMBER
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2132

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11/01/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/717,444

Applicant(s)

SPACEY, SIMON ALAN

Examiner

Abdulhakim Nobahar

Art Unit

2132

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

**Claims 1-16** are objected to because of the following informalities:

1. Claims 1, 8 and 10, in line 1, recite: "characterised by". Comprising, consisting or including should replace this statement.
2. Claims 2 and 9, in line 1, recite: "can include" and "can include any of", respectively. "include at least one of" should replace these statements.
3. Claim 2 in line 2, recite: "can be". This statement should be replaced by "are".
4. Every claim should be ended by a period, ".".
5. Every limitation in the claims, except the last one should be ended by a semicolon, ";".
6. An "and" should be added after the semicolon to the end of limitation before the last limitation.

For example, the first claim may be written as follows:

1. A method for securing a computer system, comprising:
  - a) Augmented selected memory items by Memory Item Headers (MIH);
  - b) Replacing traditional memory to the selected memory items by Pointers to Intermediary Pointer Objects (PIPOs); and
  - c) Validating references made to the memory items through the PIPOs at run-time.

Appropriate correction is required.

**Claims 3 and 16** are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim *should refer to other claims in the alternative only, or, and cannot depend from any other multiple dependent claim*. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 15** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim.

**Claim 16** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

This claim is indefinite because applicant neither discloses nor suggests any embodiment or descriptions in the specification that one of ordinary skill in the art would reasonably interpret the apparatus for performing the recited methods of the previous claims would require any hardware components.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claim 11** is rejected under 35 U.S.C. 101 because the claimed invention is directed to a non-statutory subject matter.

This claim is directed to software per se, which is non-patentable material. Thus, the claimed invention in this claim does not fulfill the requirements of 35 U.S.C. 101 and is non-statutory.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yarom (5,949,973).**

Regarding claims 1, 15 and 16, Yarom discloses:

A method for securing a computer system, characterised by:

- a) Augmented selected memory items by Memory Item Headers (MIH) (e.g., col. 4, lines 60-65, where modifying the memory content corresponds to the recited augmenting selected memory items)
- b) Replacing traditional pointers to the selected memory items by Pointers to Intermediary Pointer Objects (PIPOs) (e.g., col. 4, lines 51-65 and col. 5, lines 1-12, where modifying the stack pointer corresponds to the recited replacing traditional pointers)
- c) Validating references made to the memory items through the PIPOs at run-time (e.g., col. 3, lines 60-63, col. 5, lines 32-36, col. 7, lines 45-46 and col. 8, lines 32-40, where blocking an attacker to access a memory location or an vulnerable program corresponds to the recited validating references made to the memory items because a legitimate username is checked).

Regarding claim 2, Yarom discloses:

A method in accordance with claim 1, wherein said selected memory items can include functions, arrays, objects, fundamentals and other program constructs that can be referenced through a traditional pointer (e.g., col. 4, lines 30-35).

Regarding claim 3, Yarom discloses:

A method in accordance with claims 1 and 2, wherein the Memory Item Headers (MIH) include information about the original memory item; said information to include at least the length of the original memory item or a biased version thereof and optionally additional information including: a) Type information b) Access rights c) Reference counts d) Object Ids (e.g., col. 4, lines 50-65).

Regarding claim 4, Yarom discloses:

A method in accordance with any of the previous claims, wherein the Pointers to Intermediary Pointer Objects hold a reference to a newly disclosed Intermediary Pointer Object (IPO); said Intermediary Pointer Object having at least two parts: a) A reference to a memory item's header (MIH) (e.g., col. 5, lines 1-12) b) An offset to a location in the memory item (e.g., col. 5, lines 27-36).

Regarding claim 5, Yarom discloses:

A method according to claim 4 wherein said offset is with regard to the start of the original memory item or the start of its MIH (e.g., col. 5, lines 37-41).

Regarding claim 6, Yarom discloses:

A method according to any of the previous claims wherein said Pointers to Intermediary Pointer Objects assume an IPO offset of zero and reference a MIH directly (e.g., col. , lines ).

Regarding claim 7, Yarom discloses:

A method according to any of the previous claims wherein said references have the same form as traditional pointers (e.g., col. 9, lines 15-21).

Regarding claim 8, Yarom discloses:

A method according to any of the previous claims wherein said validating is characterised by checking that attempts to reference a memory item through a PIPO are consistent with the information held in the corresponding MIH and IPO (e.g., col. 7, lines 55-61).

Regarding claim 9, Yarom discloses:

A method according to claim 8 wherein said consistency checking can include any of:  
a) Bounds checking b) Type checking c) Access checking d) Reference count checking  
(e.g., col. 6, lines 31-43).

Regarding claim 10, Yarom discloses:

A method according to claim 9 wherein said bounds checking is further characterised by lower and upper bounds checking that may be applied together or independently (e.g., col. 2, lines 1-14 and col. 8, lines 63...).

Regarding claim 11, Yarom discloses:



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A method according to any of the previous claims wherein said validating is performed by instrumentation implemented in either: a) Software or b) Hardware (e.g., col. 3, lines 45-55).

Regarding claim 12, Yarom discloses:

A method according to claim 11 wherein, said hardware instrumentation is implemented in the CPU of a computer system as new instructions or in modifications to the microcode for existing instructions (e.g., col. 1, lines 49-56).

Regarding claim 13, Yarom discloses:

A method in accordance with any of the previous claims wherein run-time PIPOs are distinguished from traditional pointers by: registers reserved for PIPOs, memory areas reserved for IPOs, tags, maps, new CPU instructions or new address modes (e.g., col. 4, lines 50-65 and col. 9, lines 22-40).

Regarding claim 14, Yarom discloses:

A method according to any of the previous claims implemented as modifications to a compilation process, run-time libraries, functions, in-line macros, system calls, source translation or other means (e.g., col. 4, lines 40-44).

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4922414 A to Holloway; John T. et al.

US 20030014667 A1 to Kolichtchak, Andrei.

US 6467083 B1 to Yamashita; Fumiaki.

US 5206933 A to Farrell; Joseph K. et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdulhakim Nobahar whose telephone number is 571-272-3808. The examiner can normally be reached on M-T 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Art Unit 2132 *a.n.*

October 19, 2007

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